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Here, on Mt. Rose, Nevada, Dr. J. E. Church made the first western snow survey 50 years ago.

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U. S. DEPARTMENT OF AGRICULTURE

FEDERAL - STATE - PRIVATE COOPERATIVE

SNOW SURVEY and WATER SUPPLY FORECASTS for MONTANA & NORTHERN WYOMING

UNITED STATES DEPARTMENT of AGRICULTURE···SOIL CONSERVATION SERVICE.
and
MONTANA AGRICULTURAL EXPERIMENT STATION

In cooperation with the U.S. Forest Service, U.S. Geological Survey, National Park Service, U.S. Bureau of Reclamation, State Engineers of Montana and Wyoming and other Federal, State and private organizations.

AS OF
FEB. 1, 1959

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

TO RECIPIENTS OF COOPERATIVE SNOW SURVEY AND WATER SUPPLY FORECAST REPORTS:

The climate of the cultivated and populated areas of the West is characterized by relatively dry summer months. Such precipitation as occurs falls mostly in the winter and early spring months when it is of little immediate benefit to growing crops. Fortunately, most of this precipitation falls as mountain snow which stays on the ground for months, melting later to sustain streamflow during the period of greatest demand during late spring and summer. Thus, nature provides in mountain snow an imposing water storage facility.

The amount of water stored in mountain snow varies from place to place as well as from year to year and accordingly, so does the runoff of the streams. The best seasonal management of variable western water supplies results from fore-knowledge of the runoff.

A snow survey consists of a series of about ten samples taken with specially designed snow sampling equipment along a permanently marked line, about 1000 feet in length, called a snow course. The use of snow sampling equipment provides snow depth and water equivalent values for each sampling point. The average of these values is reported as the snow survey measurement for a snow course.

Snow surveys are made monthly or semi-monthly beginning in January or February and continue through the snow season until April, May or June. Currently more than 1300 western snow courses are measured each year. These measurements furnish the key data for water supply forecasts.

By relating snow survey measurements taken over a period of years to spring-summer runoff during the same period, relationships have been developed which make it possible to forecast seasonal runoff several months in advance of occurrence. In order to make a forecast, once a forecast relationship has been developed, the maximum snow water content at previously selected key snow courses is usually entered in the forecast relationship. More accurate forecasts are often obtained when other factors such as soil moisture, base flow and spring precipitation are considered and included in the forecast relationships.

Listed below are the Federal-State-Private Cooperative Snow Survey and Water Supply Forecast reports available for the West which contain detailed information on snow survey measurements, streamflow forecasts, reservoir storage, soil moisture and other guide data to water management and conservation decisions.

PUBLISHED BY SOIL CONSERVATION SERVICE

REPORTS	ISSUED	COOPERATING WITH	LOCATION
RIVER BASINS			
COLORADO, RIO GRANDE AND ARKANSAS	MONTHLY (FEB.-MAY)	COLO. EXP. STATION COLO. STATE ENGINEER NEW MEXICO STATE ENGINEER	FT. COLLINS, COLO.
COLUMBIA *Includes Alaska*	MONTHLY (JAN.-MAY)	IDAHO STATE ENGINEER	BOISE, IDAHO
UPPER MISSOURI	MONTHLY (FEB.-MAY)	MONT. AGR. EXP. STATION	BOZEMAN, MONTANA
WEST-WIDE	(OCT. 1, APR. 1 AND MAY 1)	COOPERATORS	PORTLAND, OREGON
STATES			
ARIZONA	SEMI-MONTHLY (JAN. 15-APR. 1)	SALT R. VALLEY WATER USERS ASSOCIATION	PHOENIX, ARIZONA
NEVADA	MONTHLY (FEB.-APR.)	NEVADA STATE ENGINEER	RENO, NEVADA
OREGON	MONTHLY (JAN.-MAY)	ORE. AGR. EXP. STATION	PORTLAND, OREGON
UTAH	MONTHLY (JAN.-MAY)	UTAH STATE ENGINEER UTAH AGR. EXP. STATION	SALT LAKE CITY, UTAH
WASHINGTON	MONTHLY (FEB.-MAY)	WASH. STATE DEPT. OF CONSERVATION	SPOKANE, WASHINGTON
WYOMING	MONTHLY (FEB.-JUNE)	WYOMING STATE ENGINEER	CASPER, WYOMING

Copies of the various reports may be secured from: Head, Water Supply Forecasting Section
Soil Conservation Service
209 S.W. 5th Avenue, Portland 4, Oregon

PUBLISHED BY OTHER AGENCIES

OTHER SNOW SURVEY REPORTS			
BRITISH COLUMBIA	MONTHLY (FEB.-JUNE)	COMPTROLLER, WATER RIGHTS BR., DEPT. OF LANDS AND FORESTS, PARLIAMENT BLDGS.	VICTORIA, B.C.
CALIFORNIA	MONTHLY (FEB.-MAY)	CALIFORNIA DEPARTMENT OF WATER RESOURCES,	SACRAMENTO, CALIFORNIA

FEDERAL-STATE-PRIVATE COOPERATIVE

SNOW SURVEYS and WATER SUPPLY FORECASTS

for

MONTANA AND NORTHERN WYOMING

(Upper Missouri and Upper Columbia River Basins)

Report Prepared by:

A. R. Codd
Hydraulic Engineer
Soil Conservation Service

Soil Conservation Service
U. S. Department of Agriculture
and
Montana Agricultural Experiment Station
Bozeman, Montana

Report Issued by:

H. D. Hurd
State Conservationist
of Montana

O. W. Monson
Irrigation Engineer
Montana Agricultural
Experiment Station

R. E. Huffman
Director
Montana Agricultural
Experiment Station

WATER SUPPLY OUTLOOK
FOR MONTANA
February 1, 1959

* * * *

COLUMBIA RIVER BASIN

FLATHEAD RIVER

The 1959 February snow-pack on the South Fork and Middle Fork of the Flathead River is 140 percent of last year and 120 percent average. February indications are very good and should insure an adequate water supply for the 1959 season.

On the Clark Fork Basin the February snow-pack is 104 percent of last season and 105 percent average. This February snow-pack should produce a GOOD water supply.

KOOTENAI RIVER

Snow-Survey measurements furnished by the Division of Water Rights in British Columbia indicate that there is an adequate snow-pack on the Upper Kootenai River. Measurements show the February snow-pack to be 106 percent of last season and 99 percent of the 1938-52 average.

UPPER MISSOURI RIVER BASIN
SNOW SURVEY COURSES
IN
MONTANA & NORTHERN WYOMING

LEGEND
- TOWNS AND CITIES
- 1304 SNOW SURVEY COURSE
- 901 IDAHO & WYOMING NUMBERS
- STREAM GAGING STATIONS

1959

U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE
BOZEMAN MONTANA

SCALE IN MILES 50 25 0 50 100

KOOTENAI
FLATHEAD
ST. MARY
MILK
MARIAS
MILK
LIBBY
KALISPELL
COLUMBIA FALLS
SHELBY
HAVRE
GLASGOW
MERON
THOMPSON FALLS
POLSON
FLATHEAD SO. FORK
TETON
CHOTEAU
SUN
UPPER MISSOURI
PLAINS
ST REGIS
AUGUSTA
GREAT FALLS
BLACKFOOT
OVANDO
LEWISTOWN
CLARK FORK
BITTERROOT
MISSOULA
HELENA
MUSSELSHELL
IDAHO
HAMILTON
DARBY
ANACONDA
HARLOWTON
LOWER YELLOWSTONE
MILES CITY
BIG HOLE
JEFFERSON
BUTTE
WILSALL
BOZEMAN
LIVINGSTON
BILLINGS
MADISON
GALLATIN
RUBY
BEAVERHEAD
DILLON
UPPER YELLOWSTONE
CORWIN SPRINGS
CLARK FORK (YELLOWSTONE RIVER)
RED LODGE
POWDER RIVER
TONGUE
SHERIDAN
ARVADA
MONTANA
WYOMING
SHOSHONE
CODY
GREYBULL
NEETEETSE
SHELL
BUFFALO
WORLAND
BIG HORN
NOWOOD
KOYCEE
THERMOPOLIS
WIND
DUBOIS
POPO AGIE
RIVERTON
LANDER
SOUTH DAKOTA

REVISED SEPTEMBER 1, 1959 B.R.-11,484

INDEX TO MONTANA & NORTHERN WYOMING SNOW COURSES

Drainage Basin and Course Name	Montana Number	Elev.	Location Sec. Lat.	Location Twp.	Range Long.	Record Began	Measuring Dates	Measured By
JEFFERSON RIVER			**MISSOURI RIVER DRAINAGE**					
(ROCK-BEAVERHEAD)								
Lakeview Ridge	11E3	7400	27	1½S	2W	1948	3,4,5	10
Lakeview Canyon	11E4	6930	26	1½S	2W	1948	3,4,5	10
Limekiln	12E2	6950	5	1SS	9W	1948	3,4	1
White Pine Ridge	12E1	8850	18	1½S	9W	1948	3,4	1
(HORSE PRAIRIE)								
Bleedy Dick	13D10	7600	12	8S	16W	1948	3,4	1
Cold Stone	13D9	8100	11	8S	16W	1948	3,4	1
Lemhi Pass	13E1	7480	9	10S	15W	1948	3,4	1
Terrell Creek	13D12	6650	14	9S	15W	1948	3,4	1
Trail Creek	13E2	7090	15	10S	15W	1948	3,4	1
Selway Junction	13D11	6800	27	8S	15W	1948	3,4	1
(BIG HOLE)								
Big Hole Pass	1303	7240	28	3S	18W	1948	3,4	1
Big Hole Pass-Be.	1304	6900	24	3S	18W	1948	3,4	1
East Boundary	1305	6700	22	3S	17W	1948	3,4	1
Gibbons Pass	13D2	7100	4	2S	19W	1934	1,2,3,4,5	1,3
Jahnke Creek	1308	7340	25	7S	16W	1948	3,4	1
Miner Forks	13D6	7300	24	6S	17W	1948	3,4	1
Miner Lake	13D7	6720	10	6S	16W	1945	3,4,5	1
(WISE RIVER)								
Anderson Mdw.	13D14	7000	18	3S	12W	1948	3,4	1
Elk Horn	13D15	8450	15	4S	12W	1935	3,4,5	3
Wise River	13D13	6300	15	2S	12W	1948	3,4	1
(RUBY RIVER)								
Flashlight	1203	6950	22	8S	7W	1945	3,4,5	1
MADISON RIVER								
Nebgen	11E5	6550	22	11S	3E	1934	1,2,3,4,5	3
West Yellowstone	11E7	6700	34	13S	5E	1934	1,2,3,4,5	3
Norris Basin	10E2	7500	44°-44'		110°-42'	1936	3,4	6
GALLATIN RIVER								
Devil's Slide	10D4	8100	14	5S	6E	1935	2,3,4,5	2,1
Hood Meadow	10D3	6600	22	4S	6E	1935	2,3,4,5	2,1
New World	10D1	6700	24	3S	6E	1939	1,2,3,4,5	7
21-Mile	11E6	7150	1	11S	5E	1934	1,2,3,4,5	3
MISSOURI RIVER MAIN STEM								
Obsesman Reservoir	12C5	6200	2	8N	5W	1936	1,2,3,4,5	3
Crystal Lake	9C1	6100	19	12N	18E	1941	3,4	1,2
Grasshopper	10C2	7000	19	9N	8E	1938	3,4	2
Kinge Hill	10C1	7950	35	13N	7E	1934	3,4,5	3
Pionie Grounds	12C6	6500	10	5N	6W	1941	2,3,4	4
Pipestone Pass	12D1	7200	11	1N	7W	1938	2,3,4,5	1
Stemple Pass	12C1	6900	16	13N	7W	1934	3,4,5	3
Ten Mile Creek L	12C2	6250	13	8N	6W	1935	1,2,3,4,5	3
Ten Mile Creek M	12C3	6800	13	8N	6W	1934	1,2,3,4,5	3
Ten Mile Creek U	12C4	8000	19	8N	5W	1935	1,2,3,4,5	3
(TETON RIVER)								
Freight Creek	12A1	6000	13	26N	10W	1948	3,4	1
Waldron Creek	12B2	5600	16	25N	9W	1948	3,4	1
West Fork	12B1	6000	6	25N	9W	1948	3,4	1
(SUN RIVER)								
Benchmark	12B8	5500	9	20N	10W	1948	3,4	1
Cabin Creek	12B6	5400	33	23N	10W	1949	3,4	1,2
5-Bull	12B9	5600	36	20N	10W	1948	3,4	1,2
Gates Park	12B5	5300	31	21N	10W	1949	3,4	1,2
Goat Mountain	12B7	7000	20	22N	10W	1934	3,4	3
Wrong Ridge	12B3	6800	17	25N	10W	1949	3,4	1,2
Wrong Creek	12B4	5700	32	25N	10W	1949	3,4	1,2
(MARIAS RIVER)								
Marias Pass	13A5M	5250	34	30N	14W	1934	1,2,3,4,5	3
(MILK RIVER)								
Rocky Boy	9A1	5200	15	28N	16E	1941	3,4	7
(MUSSELSHELL RIVER)								
Grasshopper	10C2	7000	19	9N	8E	1938	3,4	2

Drainage Basin and Course Name	Montana Number	Elev.	Location Sec. Lat.	Location Twp.	Range Long.	Record Began	Measuring Dates	Measured By
MISSOURI RIVER DRAINAGE (cont.)								
(UPPER YELLOWSTONE)								
Camp Senia	9D1	7890	2	8S	18E	1937	4	1
Canyon	10E3	7750	44°-44'		110°-30'	1938	1,2,3,4,5	6
Cooke City	10D7	7400	25	9S	14E	1937	1,2,3,4,5	6
Crevice Mt.	10D5	8400	22	9S	9E	1935	3,4	2
Independence	10D6	8000	22	7S	12E	1940	3,4	1
Lake Camp	10E4	7850	44°-34'		110°-24'	1936	1,2,3,4,5	6
Lupine Creek	10E1	7300	44°-54'		110°-37'	1938	1,2,3,4,5	6
Lodgepole	9E1	8200	32	56N	106W	1940	2,3,4,5	1,4
(SHIELDS RIVER)								
Porcupine	10C3	6500	10	4N	10E	1938	3,4	1
LOWER YELLOWSTONE								
(WIND RIVER) Wyoming								
Big Warm	9F12	8800	36	42N	109W	1955	2,3,4,5	1
Brooke Lake #3	10F8	9200	23	44N	110W	1939	2,3,4,5	1
Burroughs Creek	9F4	8800	15	43N	107W	1948	2,3,4,5	1
Dinwoodie	9F10	10000	21	39N	105W	1948	2,3,4,5	1
Dry Creek	9F9	9500	34	4N	6W	1948	2,3,4,5	1
DuNoir	9F6	8750	27	42N	108W	1940	2,3,4,5	1
East Fork	9F13	9200	23	44N	104W	1956	2,3,4,5	1
Geyser Creek	9F7	8500	12	41N	108W	1948	2,3,4,5	1
Little Warm	9F8	9500	24	41N	108W	1948	2,3,4,5	1
Sheridan B.S. #1	9F5	7500	3	42N	109W	1939	2,3,4,5	1
Sheridan R.S. #2	9F14	7500	3	42N	109W	1955	2,3,4,5	1
T-Cross Ranch	9F3	8000	1	43N	107W	1940	2,3,4,5	1
Togwotee Pass	10F9	9600	29	44N	110W	1936	2,3,4,5	11
(POPO AGIE RIVER) Wyoming								
Blue Ridge	802	9500	23	31N	101W	1939	2,3,4,5	1
Bruce's Camp	805	6500	24	32N	101W	1955	2,3,4	1
Hobb's Pork	903	10000	22	2S	3W	1948	2,3,4,5	1
Mosquito Park B.S.	904	9500	23	2S	3W	1940	2,3,4,5	1
Sawmill Glade	801	8500	3	31N	101W	1939	2,3,4,5	1
South Pass	803	9000	13	30N	101W	1939	2,3,4,5	1
St. Lawrence	9F11	9000	26	1N	4W	1940	2,3,4,5	1
Trout Creek	902	8400	5	2S	2W	1948	2,3,4,5	1
(OWL CREEK) Wyoming								
Beavers Mill	9F2	8900	6	43N	102W	1948	2,3,4,5	1
Owl Creek	8F1	8700	36	43N	101W	1948	2,3,4,5	1
(GREYBULL RIVER) Wyoming								
Timber Creek #1	9E2	8800	25-	47N	103W	1948	2,3,4,5	1
Timber Creek #2	9E3	8800	25	47N	103W	1955	2,3,4,5	1
Wood River #1	9F1	8000	28	46N	103W	1939	2,3,4,5	1
Wood River #2	9F15	8000	28	46N	103W	1956	2,3,4,5	1
(SHOSHONE RIVER) Wyoming								
East Entrance	10E6	7000	17	52N	109W	1948	1,2,3,4,5	6
Sylvan Pass	10E5	7100	12	52N	110W	1936	1,2,3,4,5	6
(NOWOOD CREEK) Wyoming								
Cold Springs Camp	7E25	8700	1	50N	88W	1956	2,3,4,5	1
Medicine Lodge Lks	7E24	9500	7	51N	87W	1956	2,3,4,5	1
Munkers Pase	7E8	9700	11	48N	85W	1950	2,3,4,5	1
North Powder	7E36	8300	20	47N	85W	1956	2,3,4,5	1
Onion Gulch	7E27	8100	31	48N	85W	1956	2,3,4,5	1
Tensleep Lake	7E26	9075	33	50N	86W	1956	2,3,4,5	1
Tensleep R.S.	7E7	8300	30	49N	86W	1935	2,3,4,5	1
Tyrell R.S.	7E35	8300	30	49N	86W	1956	2,3,4,5	1
(SHELL CREEK) Wyoming								
Bald Mountain	7E21	9600	33	56N	91W	1956	2,3,4,5	1
Beaver-Tongue Div.	7E20	9200	12	55N	91W	1956	2,3,4,5	1
Bone-Spring Div.	7E18	9200	32	55N	89W	1956	2,3,4,5	1
Granite Creek Camp	7E22	7800	15	53N	89W	1956	2,3,4,5	1
Granite Pase	7E17	8950	19	54N	88W	1956	2,3,4,5	1
Horse-Trail Div.	7E19	9200	29	55N	90W	1956	2,3,4,5	1
Ranger Creek	7E4	8800	32	53N	88W	1935	2,3,4,5	1
Shell Creek	7E23	9600	12	52N	88W	1956	2,3,4,5	1
(PORCUPINE CREEK) Wyoming								
Five Spgs. Falls	7E31	7500	19	56N	92W	1956	2,3,4,5	1
Medicine Wheel	7E30	9000	24	56N	92W	1956	2,3,4,5	1
(TONGUE RIVER) Wyoming								
Beaver Tongue Div.	7E20	9200	12	55N	91W	1956	2,3,4,5	1
Big Goose #1	7E2	7700	4	53N	86W	1935	2,3,4,5	1
Big Goose #2	7E32	7700	4	53N	86W	1955	2,3,4,5	1
Bone-Spring Div.	7E18	9200	32	55N	89W	1956	2,3,4,5	1
Burgess R.S. #1	7E1	7900	36	56N	89W	1950	2,3,4,5	1
Burgess R.S. #2	7E33	7900	36	56N	89W	1955	2,3,4,5	1
Dome Lake #1	7E3	8800	11	53N	87W	1950	2,3,4,5	1
Dome Lake #2	7E34	8800	11	53N	87W	1950	2,3,4,5	1
Gloom Creek	7E14	9300	32	55N	87W	1956	2,3,4,5	1
Granite Pass	7E17	8950	19	54N	88W	1956	2,3,4,5	1

Drainage Basin and Course Name	Montana Number	Elev.	Location Sec. Lat.	Location Twp.	Range Long.	Record Began	Measuring Dates	Measured By
MISSOURI RIVER DRAINAGE (cont.)								
(TONGUE RIVER cont.)								
Borse Trail Div.	7E19	9200	29	55N	90W	1956	2,3,4,5	1
Lake Geneva	7E16	9000	7	52N	86W	1956	2,3,4,5	1
North Tongue	7E15	8800	17	55N	89W	1956	2,3,4,5	1
Sibley Lake	7E11	8000	10	55N	88W	1956	2,3,4,5	1
Sucker Creek	7E12	9000	19	55N	87W	1956	2,3,4,5	1
Steamboat Point	7E10	7500	32	56N	87W	1956	2,3,4,5	1
Wood Rock O.S.	7E13	8500	3	54N	88W	1956	2,3,4,5	1
(POWDER RIVER) Wyoming								
Crazy Woman	6E2	8200	6	47N	84W	1956	2,3,4,5	1
Muddy Creek O.S.	6E1	7800	2	48N	84W	1956	2,3,4,5	1
Munkere Pase	7E8	9700	11	48N	85W	1950	2,3,4,5	1
North Powder #2	7E36	8300	20	47N	85W	1956	2,3,4,5	1
Onion Gulch	7E27	8100	31	48N	85W	1956	2,3,4,5	1
Soldier Park	7E5	8700	36	51N	85W	1950	2,3,4,5	1
Sour Dough	7E6	8500	17	49N	84W	1936	2,3,4,5	1
COLUMBIA RIVER BASIN								
KOOTENAI RIVER								
Baree Creek	15B11	5500	6	25N	30W	1956	4,5,5½	2
Baree Mountain	15B1	6000	1	25N	31W	1937	4,5,5½	2
Red Mountain	15A1	6000	4	36N	29W	1937	3,4,5,5½	1,2
Weasel Divide	14A7	5450	8	37N	24W	1955	4,5,5½	1,2
FLATHEAD RIVER								
Basin Creek	13B14A	5000	11	19N	12W	1951	2,3,4,5	2
Big Creek	13B3	6750	6&7	22N	18W	1941	3,4,5	5
Brush Creek	14A4	5000	13	30N	26W	1937	3,4,5	1,2
Cattle Queen	13A1	4700	7	35N	17W	1939	3,4,5	6
Deeert Mountain	13A2M	5600	24	31N	19W	1937	1,2,3,4,5	1,2
Hell Roaring Div.	14A3	5770	35	32N	22W	1942	3,4,5	1,2
Holbrook	13B13A	4530	18	21N	13W	1951	1,2,3,4,5	2
Kishenehn	14A6	3886	14	37N	22W	1954	4,5	6
Logan Creek	14A5	4300	34	30N	24W	1937	3,4,5	2
Marias Pase	13A5M	5250	34	30N	14W	1934	1,2,3,4,5	3
Mineral Creek	13A16	4000	29	35N	17W	1957	3,4,5	6
Quintonkon	13A13	3800	11	26N	17W	1951	2,3,4,5	1,2
Spotted Bear Mt.	13B2M	7000	23	25N	15W	1948	3,4,5	1,2
Strawberry Lake	13A10	6500	11	28N	19W	1948	3,4,5	2
Trinkus Lake	13B1	6500	9	25N	17W	1948	3,4,5	2
Trout Lake	13A12M	3600	21	28N	17W	1948	3,4,5	1,2
Twin Creeks	13B11	3580	14	26N	16W	1951	2,3,4,5	1,2
Upper Holland Lk.	13B5	7000	28	20N	16W	1948	3,4,5	2
CLARK FORK								
Baree Creek	15B11	5500	6	25N	30W	1956	4,5,5½	2
Baree Mountain	15B1	6000	1	25N	31W	1937	4,5,5½	2
Coyote Hill	13B10	4200	12	18N	16W	1952	1,2,3,4,5	2
El Dorado Mine	13C9	7800	23	8N	12W	1949	4	1
Fred Burr Pass	13C11	8000	12	6N	13W	1957	3,4,5	1
Freezeout Summit	15B10	6800	21	15N	27W	1937	4,5	2
Gold Creek Lk.	13C10	7200	14	8N	12W	1949	4	1
Hoodoo Creek	15C1	6200	9	14N	27W	1937	4,5	2
Intergaard	13C4	6450	6	5N	13W	1936	2,3,4	4
Lubrecht Forest #6	13C8	4400	11	14N	15W	1951	1,2,3,4,5	12
North Fork Jocko	13B7	6330	3	17N	17W	1941	3,4,5	5
Pipestone Pass	1201	7200	10	1N	7W	1938	2,3,4,5	1
Red Lion	13C12	7000	27	6N	13W	1958	3,4,5	1
Slide Rock Mt.	13C2	7100	35	10N	16W	1937	4	1
Southern Cross	13C5	6500	8	5N	13W	1936	2,3,4	4
Stemple Pase	12C1	6900	16	13N	7W	1934	3,4,5	3
Storm Lake	13C7	7780	19	4N	13W	1939	2,3,4	1
Stuart Mill	13C6	6500	19	5N	13W	1936	2,3,4	4
Stuart Mountain	13C1	7400	6	14N	18W	1936	4	1,2
TV Mountain	14B1	6800	33	15N	19W	1956	1,2,3,4,5	1
BITTERROOT RIVER								
East Fork R.S.	13D1	5400	16	2N	17W	1937	4	1
Gibbons Pass	13D2	7100	4	2S	19W	1934	1,2,3,4,5	3,1
Lolo Pass	14C5	5230	16	38N	15E	1956	3,4,5,5½	2
Nez Perce Camp	14D2	5580	19&20	1S	23W	1937	3,4,5	1
Nez Perce Pass	14D1	6575	32	28N	17E	1937	1,2,3,4,4½,5,5½	1
Powell R.S.	14C6	4230	33	37N	14E	1956	3,4,5,5½	2
Skalkaho Summit	13C3	7259	30	6N	17W	1937	4	1
SASKATCHEWAN RIVER BASIN								
ST. MARY RIVER								
Iceberg Lake #3	13A3	5600	48°-50'		113°-43'	1922	5	
Josephine Upper	13A15	5000	48°-50'		113°-42'	1956	5	3,9
Josephine Lower #9	13A14	4900	48°-47'		113°-41'	1955	5	
Mount Allen #7	13A7	5700	48°-46'		113°-41'	1922	5	3,9
Piegan #6	13A6	5500	48°-46½'		113°-41½'	1922	5	3,9
Ptarmigan #8	13A8	5800	48°-50'		113°-44'	1937	5	3,9

a. Numerals 1,2,3,4 and 5 refer to January 1, February 1, March 1, April 1 and May 1.

b. Numerals refer to Agency that secures the snow survey as follows:

1. Soil Conservation Service
2. U. S. Forest Service
3. U. S. Geological Survey
4. Montana Power Company
5. U. S. Indian Service
6. National Park Service
7. Montana Experiment Station
8. City of Bozeman
9. Dominion Water & Power Bureau
10. U. S. Fish and Wildlife Service
11. U. S. Bureau of Reclamation
12. Montana State Forestry School

M - Soil Moisture
A - Aerial Marker

5,R-11,484 59M-46-3(3)

COMPARISON OF SNOW COVER WITH THAT OF PREVIOUS YEARS

Summary of Snow-Survey Data by Tributary Watersheds February 1, 1959

TRIBUTARY BASINS	No. of Courses Averaged	No. Years Used	1959 Snow Water Equivalent Expressed as Percent of		
			1958	1959	Average
MISSOURI RIVER BASIN IN MONTANA					
JEFFERSON RIVER	4	15	96	91	86
MADISON RIVER	7	9-15	97	67	72
GALLATIN RIVER	4	5-15	105	106	103
MISSOURI MAIN STEM	5	15	112	128	96
UPPER YELLOWSTONE	6	11-15	120	92	85
COLUMBIA RIVER BASIN IN MONTANA					
KOOTENAI RIVER ABOVE LIBBY	6	8-15	106	98	99
FLATHEAD RIVER	8	8-15	140	145	121
UPPER CLARK FORK	15	7-15	104	115	105

MONTANA SNOW SURVEYS ABOUT FEBRUARY 1, 1959

MISSOURI DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENTS 1959 Date of Survey	1959 Snow Depth (In.)	1959 Water Content (In.)	Past Record Water Content (In.) 1958	1957	15-Year Average 1938-52	Total Years of Record
JEFFERSON RIVER									
(Rock-Beaverhead)									
#Camp Creek	12E3	6800	1/30	19	3.9	-	-	6.4	21
#Kilgore	11E12	6200	2/1	21	3.6	5.0	7.2	7.3	22
(Big Hole)									
Gibbons Pass	13D2	7100	1/30	55	14.2	14.4	14.8	15.2*	19
#Moose Creek	13D16	6200	1/28	43	10.3	10.7	11.2	11.8**	13
Storm Lake #2	13C7	7780	2/3	36	8.8	7.9	7.6	8.4**	6
MADISON RIVER									
Hebgen	11E5	6550	1/31	30	6.2	5.9	10.0	7.6	24
Norris Basin	10E2	7500	1/29	29	5.4	5.3	6.6	7.5**	9
21-Mile	11E6	7150	2/1	38	8.8	8.6	13.5	11.4	21
W. Yellowstone	11E7	6700	1/31	26	5.0	4.2	9.1	8.0	21
#Big Springs	11E9	6500	1/31	45	10.8	10.8	14.5	12.8	23
#Island Park	11E10	3600	2/1	35	6.8	9.7	10.4	10.1	23
#Valley View	11E8	6500	1/31	32	6.2	6.5	10.5	9.7**	13
GALLATIN RIVER									
Devil's Slide	10D4	8100	1/31	55	14.6	12.6	-	12.0**	5
Hood Meadow	10D3	6600	2/1	27	6.6	7.3	-	5.1**	5
New World	10D1	6700	2/24	26	6.4	6.2	5.4	6.8**	11
21-Mile	11E6	7150	2/1	38	8.8	8.6	13.5	11.4	21
MISSOURI RIVER MAIN STEM									
Chessman Res.	12C5	6200	1/29	11	2.3	2.3	1.2	3.3	23
Picnic Grounds	13C6	6500	2/2	11	1.7	2.4	3.8	3.4**	14
Pipestone Pass	12D1	7200	2/2	12	2.2	3.2	3.2	2.9*	19
Tenmile, Lower	12C2	6250	2/1	20	4.6	3.9	4.4	4.8	23
Tenmile, Middle	12C3	6800	2/1	32	7.8	6.4	5.8	7.0	24
Tenmile, Upper	12C4	8000	1/31	40	10.6	8.2	7.7	8.8	24
(Marias River)									
Marias Pass	13A5	5250	1/30	52	14.6	10.8	12.2	11.8	24
UPPER YELLOWSTONE									
Canyon	10E3	7750	2/1	42	9.8	7.7	10.0	9.8**	14
Cooke City	10D7	7400	1/31	26	5.0	4.6	5.8	6.1**	12
Lake Camp	10E4	7850	2/1	30	5.7	4.5	6.0	6.7**	13
Lodgepole, Wyo.	9E1	8200	1/30	31	6.8	5.4	7.5	8.5**	3
Lupine	10E1	7300	1/29	30	6.6	4.4	8.2	7.2*	16
#Aster Creek	10E8	7700				16.4	19.0	16.5	39
#Thumb Divide	10E7	7900	1/27	45	12.0	11.7	12.8	15.8**	11

* Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.
** Average for period of record.
# Adjacent Basin.

MONTANA SNOW SURVEYS ABOUT FEBRUARY 1, 1959

MISSOURI DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENTS 1959 Date of Survey	Snow Depth (In.)	Water Content (In.)	Past Record Water Content (In.) 1958	1957	15-Year Average 1938-52	Total Years of Record
LOWER YELLOWSTONE (Wind River)									
Big Warm	9F12	8800	1/22	23	4.7	3.7	5.3	-	4
Brooks Lake	10F8	9200	Abandoned; Use Togwotee Pass						
Burroughs Creek	9F4	8800	1/26	40	10.4	6.1	7.3	11.0**	10
Dinwoodie	9F10	10000	1/27	27	6.3	6.0	6.7	8.6**	10
Dinwoodie Glacier	---A	10500	1/30	27	6.3	-	-	-	-
Dry Creek	9F9	9500	1/27	18	3.9	2.8	3.5	4.6**	10
DuNoir	9F6	8750	1/22	21	4.3	2.7	4.5	6.3*	17
Geyser Creek	9F7	8500	1/23	17	4.2	2.3	4.2	5.5**	10
Little Warm	9F8	9500	1/23	38	10.1	7.5	9.3	11.9**	9
Sheridan R.S. #2	9F14	7500	1/22	17	3.3	2.9	4.2	-	4
T-Cross Ranch	9F3	8000	1/26	22	4.4	3.5	5.2	5.0*	18
Togwotee Pass	10F9	9600	1/29	75	20.9	15.1	16.9	19.2	23
Twenty Lakes	---A	10500	1/30	12	2.0	-	-	-	-
LOWER YELLOWSTONE (Popo Agie River)									
Blue Ridge	8G2	9500	2/2	21	4.5	5.5	6.0	8.2*	17
Bruce's Camp	8G5	6500	2/3	11	2.1	1.6	0.6	-	3
Hobbs Park	9G3	10000	1/29	33	6.9	7.0	10.6	12.5**	10
Mosquito Park R.S.	9G4	9500	1/29	18	2.8	3.3	4.2	5.4*	15
Sawmill Glade	8G1	8500	2/2	19	3.2	4.8	4.1	5.2*	17
South Pass	8G3	9000	2/3	26	5.0	7.1	9.0	9.8*	17
St. Lawrence R.S.	9F11	9000	1/28	12	2.0	2.0	3.6	4.6*	15
Trout Creek	9G2	8400	1/29	20	2.9	3.2	3.6	3.5**	10
LOWER YELLOWSTONE (Owl Creek)									
Beavers Mill	9F2	8900	1/30	22	5.0	2.2	3.2	5.0**	10
Owl Creek	8F1	8700	1/30	17	2.9	2.4	2.2	3.7**	10
LOWER YELLOWSTONE (Greybull River)									
Timber Creek #2	9E3	8800	1/28	7	1.3	2.1	2.0	1.9**/	7
Wood River #2	9F1	8000	1/29	16	3.2	3.4	2.6	-	4

* Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.
** Average for period of record.
**/Timber Creek #1 abandoned. Timber Creek #2 average obtained from relationship of old and new courses.

MONTANA SNOW SURVEYS ABOUT FEBRUARY 1, 1959

MISSOURI DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENTS 1959 Date of Survey	1959 Snow Depth (In.)	1959 Water Content (In.)	Past Record Water Content (In.) 1958	1957	15-Year Average 1938-52	Total Years of Record
LOWER YELLOWSTONE (Shoshone River)									
#Carter Mt.	9E4	7800	1/28	9	1.4	3.1	4.0	-	2
East Entrance	10E6	7000	1/30	32	7.3	7.3	8.9	8.7**	10
Sylvan Pass	10E5	7100	1/30	39	9.6	8.1	10.1	10.2*	15
Togwotee Pass	10F9	9600	1/29	75	20.9	15.1	16.9	19.2	23
LOWER YELLOWSTONE (Nowood Creek)									
Cold Springs Camp	7E25	8700	1/27	27	6.5	4.0	4.8	-	3
Medicine Lodge Lks.	7E24	9500	1/27	37	9.2	6.6	7.2	-	3
Munkres Pass	7E8	9700	2/1	33	8.8	5.4	6.0	-	4
Onion Gulch	7E27	8100	2/1	31	7.6	5.0	6.4	-	3
Tensleep Lake	7E26	9075	1/31	38	9.1	6.7	6.4	-	3
Tensleep R.S.	7E7	8300	1/31	31	7.5	N.R	4.9	-	1
Tyrell R.S.	7E35	8300	1/31	31	7.7	4.8	4.6	-	3
LOWER YELLOWSTONE (Shell Creek)									
Bald Mountain	7E21	9600	1/26	58	17.3	8.4	11.8	-	3
Beaver-Tongue Div.	7320	9200	1/26	58	17.3	7.8	11.2	-	3
Bone-Spring Div.	7E18	9200	1/29	50	13.4	7.7	9.9	-	3
Granite Cr. Camp	7E22	7800	1/26	21	4.1	2.8	3.8	-	3
Granite Pass	7E17	8950	1/26	47	12.9	7.4	10.2	-	3
Ranger Creek	7E4	8800	1/26	35	7.8	4.8	6.5	-	3
Shell Creek	7E23	9600	1/26	43	11.3	7.5	10.0	-	3
LOWER YELLOWSTONE (Porcupine Creek)									
Five-Springs Falls	7E31	7500	1/30	33	8.5	2.4	2.6	-	3
Medicine Wheel	7E30	9000	1/27	53	16.3	6.8	9.0	-	3

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** Average for period of record.
# Adjacent Basin.

MONTANA SNOW SURVEYS ABOUT FEBRUARY 1, 1959

MISSOURI DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENTS 1959 Date of Survey	Snow Depth (In.)	Water Content (In.)	Past Record Water Content (In.) 1958	1957	15-Year Average 1938-52	Total Years of Record
LOWER YELLOWSTONE (Tongue River)									
Beaver-Tongue Div.	7E20	9200	1/26	58	17.3	7.8	11.2	-	3
Big Goose #2	7E32	7700	1/30	25	5.9	3.6	4.4	-	3
Bone-Spring Div.	7E18	9200	1/29	50	13.4	7.7	9.9	-	3
Burgess R.S. #2	7E33	7900	1/27	27	7.0	3.4	4.1	-	3
Dome Lake #2	7E34	8800	1/30	30	7.5	4.8	6.0	-	3
Gloom Creek	7E14	9300	1/28	37	10.3	6.4	6.9	-	3
Granite Pass	7E17	8950	1/29	47	12.9	7.4	10.2	-	3
North Tongue	7E15	8800	1/27	39	11.0	N.R.	4.4	-	3
Sibley Lake	7E11	8000	1/26	33	8.6	5.5	5.4	-	3
Steamboat Point	7E10	7500	1/26	26	6.3	3.4	3.4	-	3
Sucker Creek	7E12	9000	1/28	37	10.2	6.3	6.3	-	3
Wood Rock G.S.	7E13	8500	1/28	33	8.5	4.9	6.0	-	3
LOWER YELLOWSTONE (Powder River)									
Muddy Creek G.S.	7E28	7500	2/1	15	3.9	2.3	2.2	-	3
Munkres Pass	7E8	9700	2/1	33	8.8	5.4	6.0	-	4
Onion Gulch	7E27	8100	2/1	31	7.6	5.0	6.4	-	3
Soldier Park	7E5	8700	2/1	20	4.6	3.0	1.6	2.9**	7
Sour Dough	7E6	8500	2/2	24	5.5	3.8	3.8	-	3

** Average for period of record.

MONTANA SNOW SURVEYS ABOUT FEBRUARY 1, 1959

COLUMBIA DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENTS 1959 Date of Survey	Snow Depth (In.)	Water Content (In.)	Past Record Water Content (In.) 1958	1957	15-Year Average 1938-52	Total Years of Record
KOOTENAI RIVER (above Libby, Montana)									
Fernie	Can	3500	1/30	23	5.7	6.8	7.3	6.6*	19
Gray Creek	Can	5100	1/28	50	11.4	9.3	12.2	12.6**	10
Marble Canyon	Can	5000	1/30	52	11.9	9.5	13.7	11.5**	11
Nelson Creek	Can	3050	1/28	45	11.2	13.1	10.5	10.0*	20
New Fernie	Can	4100	1/30	46	11.9	10.7	10.9	11.5**	8
Sullivan Mine	Can	5100	1/29	45	9.6	8.9	8.2	10.0**	13
FLATHEAD RIVER									
Basin Creek	13B14A	5000	1/27	23	5.2	5.9	3.4	7.1**	8
Coyote Hill	13B10	4200	2/2	35	8.8	8.2	7.4	7.3**	12
Desert Mountain	13A2M	5600	1/30	51	13.1	8.2	9.1	10.1**	12
Holbrook	13B13A	4530	1/27	31	8.2	6.4	4.9	7.4**	8
Marias Pass	13A5	5250	1/30	52	14.6	10.8	12.2	11.8	24
Spotted Bear Mt.	13B2M	7000	2/3	50	13.6	7.7	9.1	9.0**	3
Trout Lake	13A12M	3600	2/4	51	13.4	9.1	8.0	11.1**	6
Twin Creeks	13B11	3580	2/4	43	11.6	7.1	7.3	8.6**	8
CLARK FORK									
Chessman Res.	12C5	6200	1/29	11	2.3	2.3	1.2	3.3	23
Coyote Hill	13B10	4200	2/2	35	8.8	8.2	7.4	7.3**	11
Fish Lake Airstrip	15C2	5000	1/31	93	25.9	27.0	23.5	26.2**	7
Intergaard	13C4	6450	2/2	19	4.2	5.6	3.8	5.1**	14
Lubrecht For. #6	13C8	5400	2/2	13	3.0	3.0	3.5	3.3**	7
Picnic Grounds	12C6	6500	2/2	11	1.7	2.4	3.8	3.4**	14
Pipestone Pass	12D1	7200	2/2	12	2.2	3.2	3.2	2.9*	19
Southern Cross	13C5	6500	2/2	13	2.7	4.3	4.0	4.1**	14
Storm Lake #2	13C7	7780	2/3	36	8.8	7.9	7.6	8.4**	6
Stuart Mill	13C6	6500	2/2	15	3.7	4.3	4.5	4.4**	14
Tenmile, Lower	12C2	6250	2/1	20	4.6	3.9	4.4	4.8	23
Tenmile, Middle	12C3	6800	2/1	32	7.8	6.4	5.8	7.0	24
Tenmile, Upper	12C4	8000	1/31	40	10.6	8.2	7.7	8.8	24
TV Mountain	14B1	6800	2/2	62	15.2	10.6	11.2	10.9**	2
#Lookout	15B2	5250	1/30	91	27.2	26.6	19.7	22.4	22
BITTERROOT									
Gibbons Pass	13D2	7100	1/30	55	14.2	14.4	14.8	15.2*	19
#Moose Creek	13D16	6200	1/28	43	10.3	10.7	11.2	11.8**	13

* Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.
** Average for period of record.
\# Adjacent Basin.

STATUS OF RESERVOIR STORAGE
February, 1959

BASIN & STREAM	RESERVOIR	USABLE CAPACITY 1000 A.F.	USABLE STORAGE - 1000 ACRE FEET 1959	1958	1957	1938-52 AVG.	YRS.
MISSOURI RIVER BASIN - MONTANA							
Beaverhead	Lima	84.0	32.2	26.7	6.4	64.5*	18
Madison River	Hebgen Lake	345.0	168.2	157.4	158.1	234.7	23
Madison River	Ennis Lake	41.0	38.5	34.8	38.4	34.0	23
Hyalite Creek	Middle Creek	8.0	4.2	3.7	3.1	3.6**	7
Missouri River	Canyon Ferry	2043.0	1699.0	1575.0	1488.0	1332.0**	5
Missouri River	Hauser Lake & Lake Helena	62.5	60.1	59.0	62.5	46.2*	19
Missouri River	Lake Helena	10.4	9.8	9.2	10.4	8.3**	13
Missouri River	Holter Lake	81.9	59.1	76.7	78.8	53.3	21
N.Fk. Sun River	Gibson	105.0		29.0	39.6	59.6	23
N.Fk. Sun River	Willow Creek	32.3		19.8	23.4	12.9	23
N.Fk. Sun River	Pishkun	32.0		12.3	16.5	15.6	23
Marias River	Tiber	1316.0		625.2	630.7	-	3
Birch Creek	Swift	30.0		19.0	23.7	19.5	23
Dupuyer & Birch	Lake Francis	112.0		94.2	90.0	72.8	23
Judith River	Ackley Lake	5.8		4.6	3.7	4.2*	20
Missouri River	Ft. Peck 3/	19410.0	8909.0	7748.0	6019.0	11240.0*	18
Milk River	Fresno	127.2	29.3	55.9	75.1	56.2*	18
Milk River	Nelson	66.8	42.5	49.8	51.4	28.5	23
W. Rosebud Cr.	Mystic Lake	20.8	11.4	7.4	6.0	8.0	23
Tongue River	Tongue River	73.9	15.4	9.0	10.8	10.0*	18
Swiftcurrent Cr.	Sherburne Lake	66.1	34.2	21.0	18.8	19.0	23
MISSOURI RIVER BASIN - WYOMING							
Shoshone River	Buffalo Bill	440.0	000.0	161.9	128.2	264.5	24
Wind River	Boysen	408.6AC	78.3	249.1	220.0	260.3**	7
Wind River	Pilot Butte	31.6	6.3	15.9	14.3	14.5	23
Bull Creek	Bull Lake	152.0	56.3	66.5	67.8	66.7*	19
Belle Fourche	Key Hole	190.0AC	0.0	1.9	14.1	13.3**	6

* Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.
** Average for period of record.
3/ Gross contents: Usable capacity less 617.0 A.F; minimum power pool 4,500 A.F.
AC Active capacity; USBR Billings.

STATUS OF RESERVOIR STORAGE
February, 1959

BASIN & STREAM	RESERVOIR	USABLE CAPACITY 1000 A.F.	USABLE STORAGE - 1000 ACRE FEET 1959	1958	1957	1938-52 AVG.	YRS.
MISSOURI RIVER BASIN - NORTH DAKOTA							
Heart River	Heart Butte	54.8AC	42.9	53.3	43.7	53.4**	8
Heart River	Dickinson	4.3AC	3.7	4.2	3.2	3.8**	8
Missouri River	Garrison Lk.	13805.0AC	2679.4	4448.0	535.2	-	4
James River	Jamestown	20.0AC	12.5	10.4	4.7	-	2
MISSOURI RIVER BASIN - SOUTH DAKOTA							
Belle Fourche	Belle Fourche	185.0AC	32.0	66.0	37.0	-	3
Cheyenne River	Angostura	160.0AC	46.4	55.9	27.8	-	3
Cheyenne River	Deerfield	15.1AC	8.6	11.3	8.2	11.3**	5
Grand River	Shadehill	84.0AC	71.4	79.4	133.4	134.4**	5
Missouri River	Ft. Randall	4900.0AC	1986.2	1552.0	1091.0	-	4
Missouri River	Gavins Point	385.0AC	316.1	325.1	189.7	-	2
Missouri River	Oahe		0	-	-	-	0
Cheyenne River	Pactola	14.8AC	18.4	13.9	1.4	-	2
COLUMBIA RIVER BASIN - MONTANA							
Flint Creek	Georgetown Lk.	31.0	28.3	19.9	19.2	22.9*	19
S.Fk. Flathead	Hungry Horse	3500.0	2956.0	2088.0	1802.0	2199.0**	5
Flathead River	Flathead Lake	1791.0	1194.0	873.0	850.0	679.0	15
Flathead River 6/	Camas Res.	42.8	23.7	26.0	30.0	21.1*	18
Flathead River 7/	Mission Valley	98.6	28.7	19.7	28.5	36.8*	18

* Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.
** Average for period of record.
6/ Camas Reservoirs are shown as a sum of (4) small reservoirs on the west side of Flathead Lake located on Dry Creek and Little Bitterroot River.
7/ Mission Valley Reservoirs are shown as a sum of (8) small reservoirs located south and east of Flathead Lake. Both Camas and Mission Valley reservoirs are operated by the Indian Irrigation Service.
AC Active capacity; USBR Billings.

Federal - State - Private
COOPERATIVE SNOW SURVEYS

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Furnishes the basic data
necessary for forecasting
water supply for irrigation,
domestic and municipal water
supply, hydro-electric power
generation, navigation,
mining and industry

"The Conservation of Water begins with the Snow Survey"